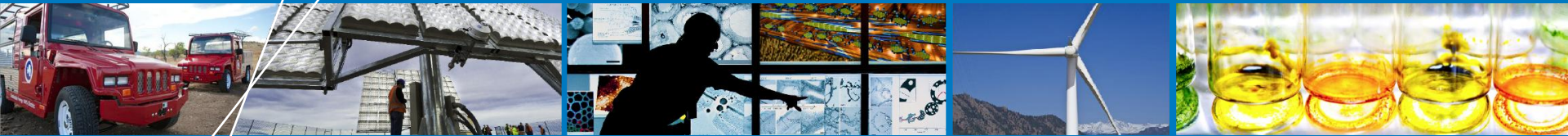


WWSIS Solar Data Checks



WWSIS Solar Working Group

Eduardo Ibanez

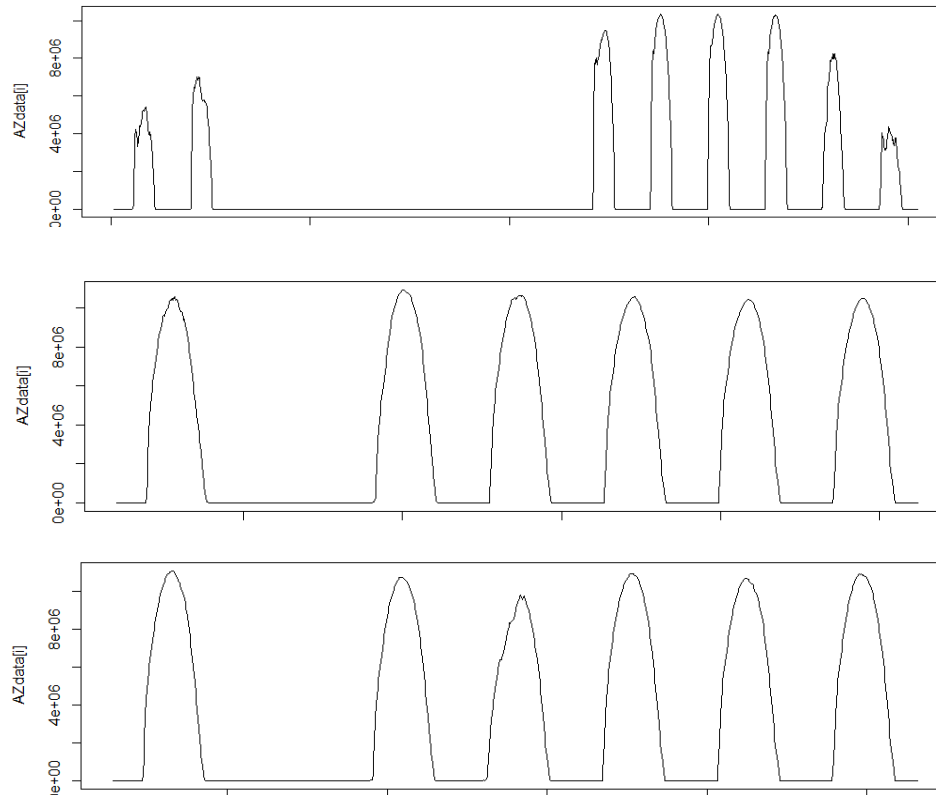
01/26/2012

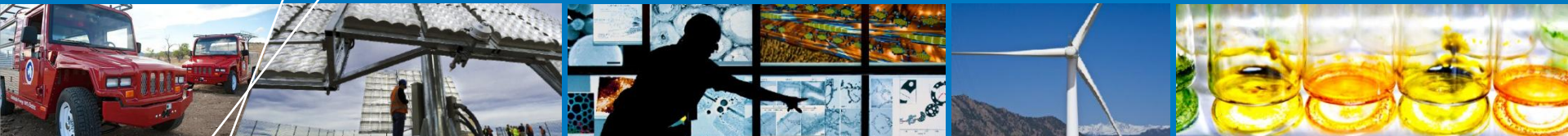
Outline

- **Missing data**
- **PV data**
 - Power curves
 - Ramp distributions
 - Hourly blips
 - Correlations
- **CSP data**
 - (Same as PV)

Missing data

- Solar irradiance data is missing for days 10-15, 137 and 151 for year 2005

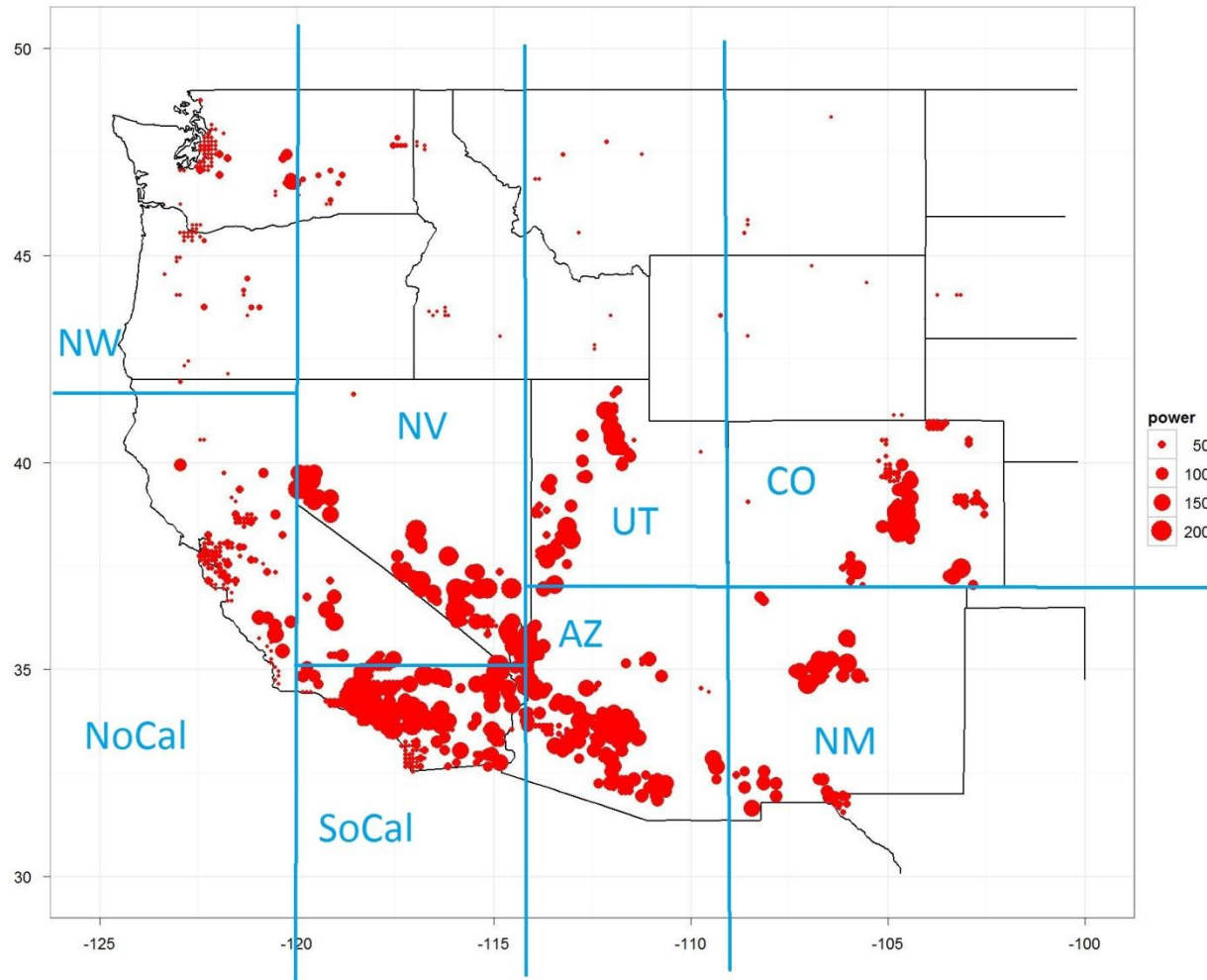




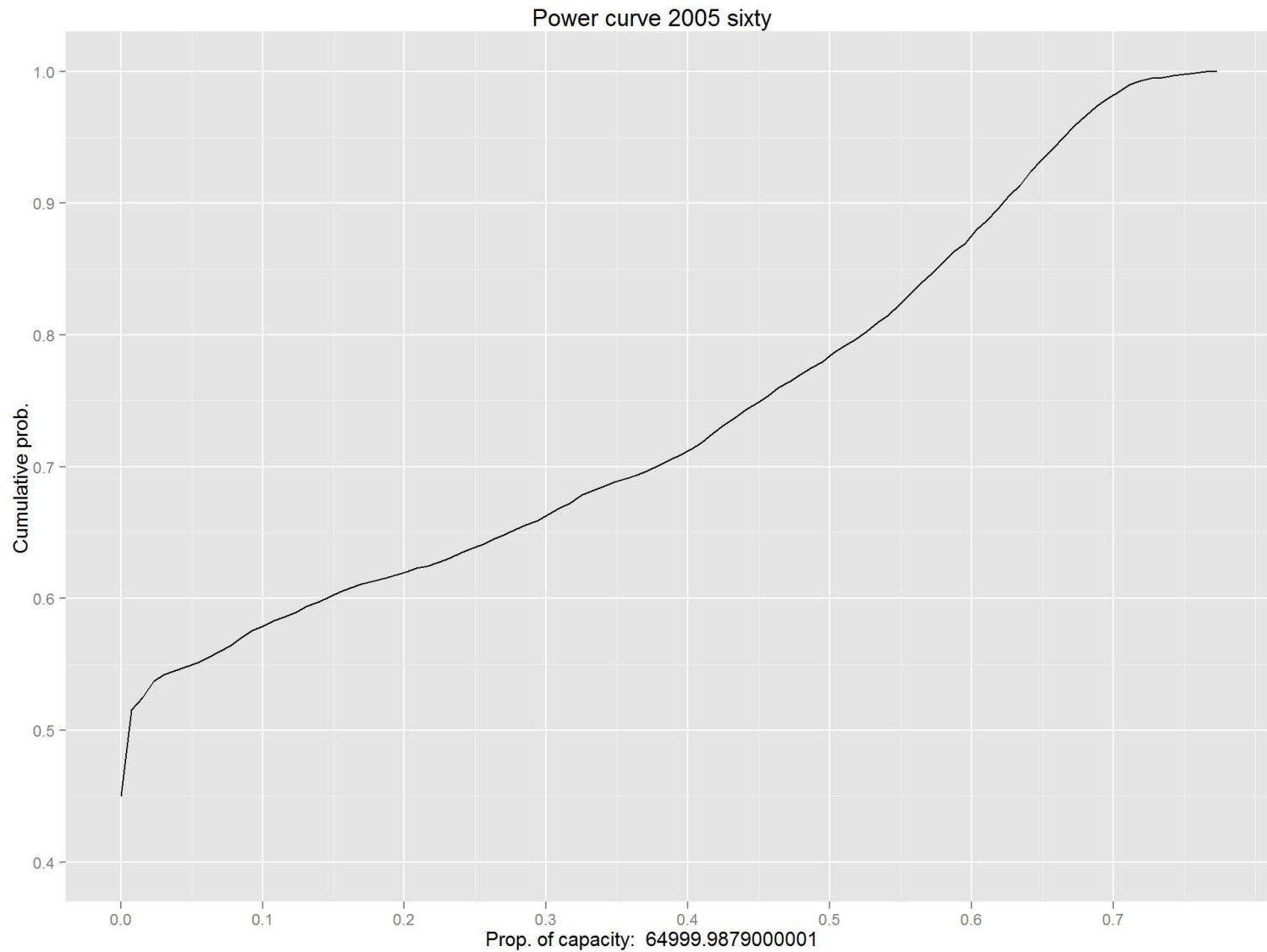
PV Data

PV Regions

- Used to test effects of aggregation

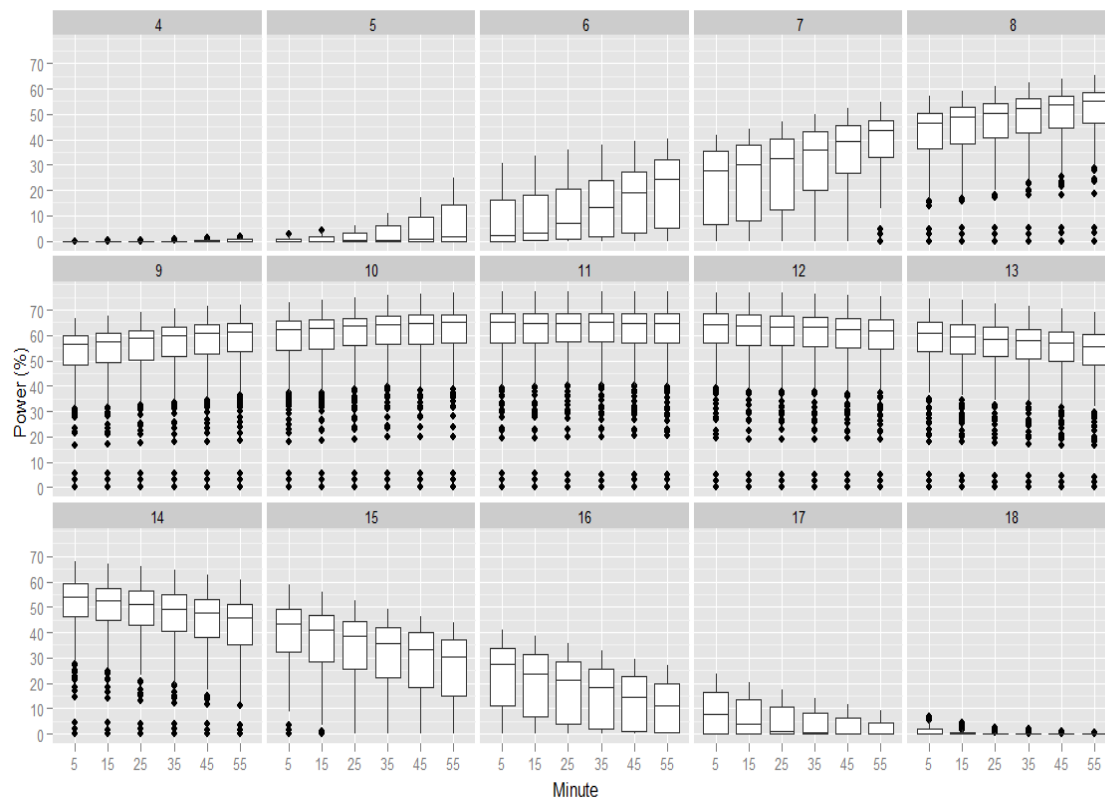


PV power curves

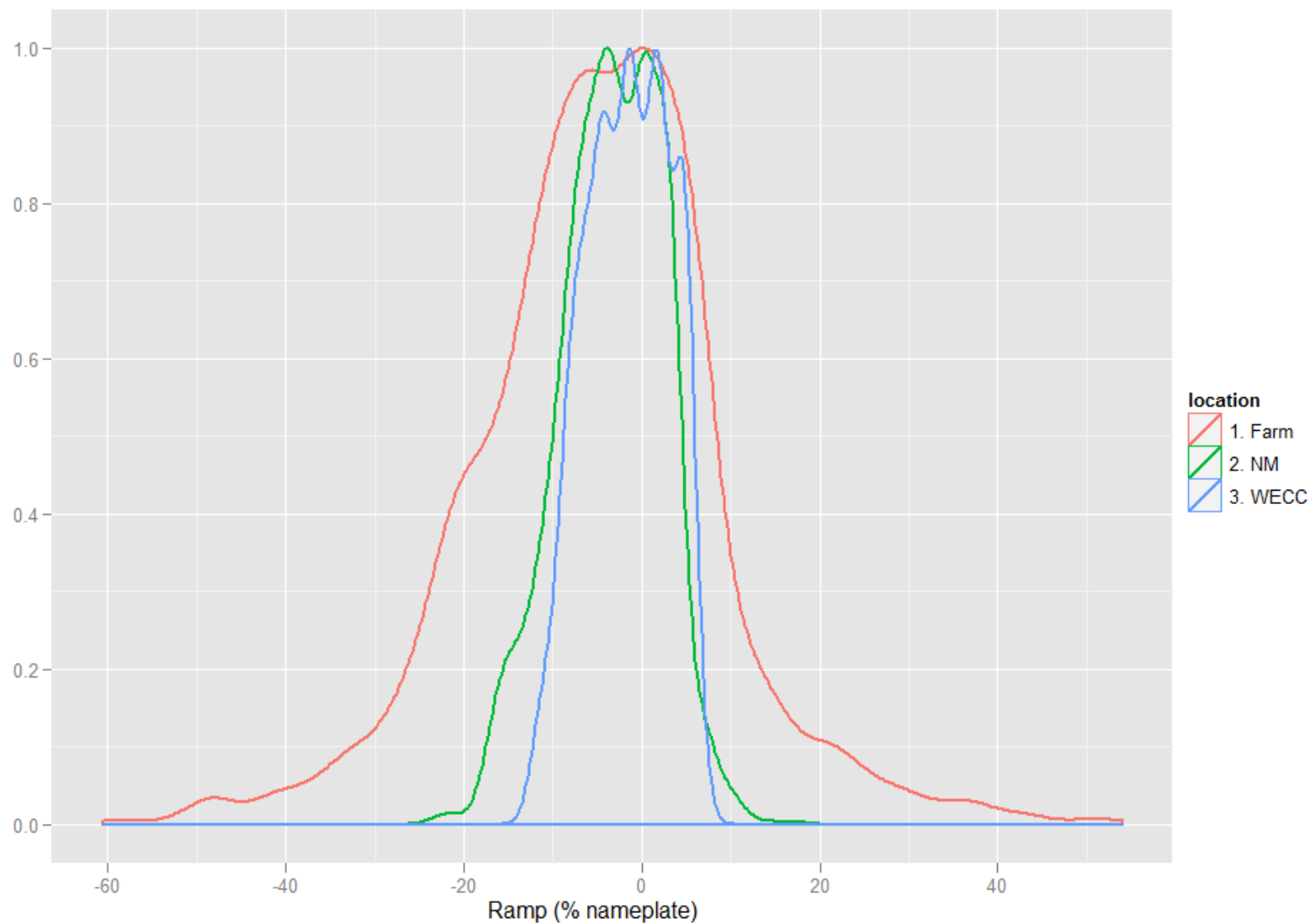


PV ramps

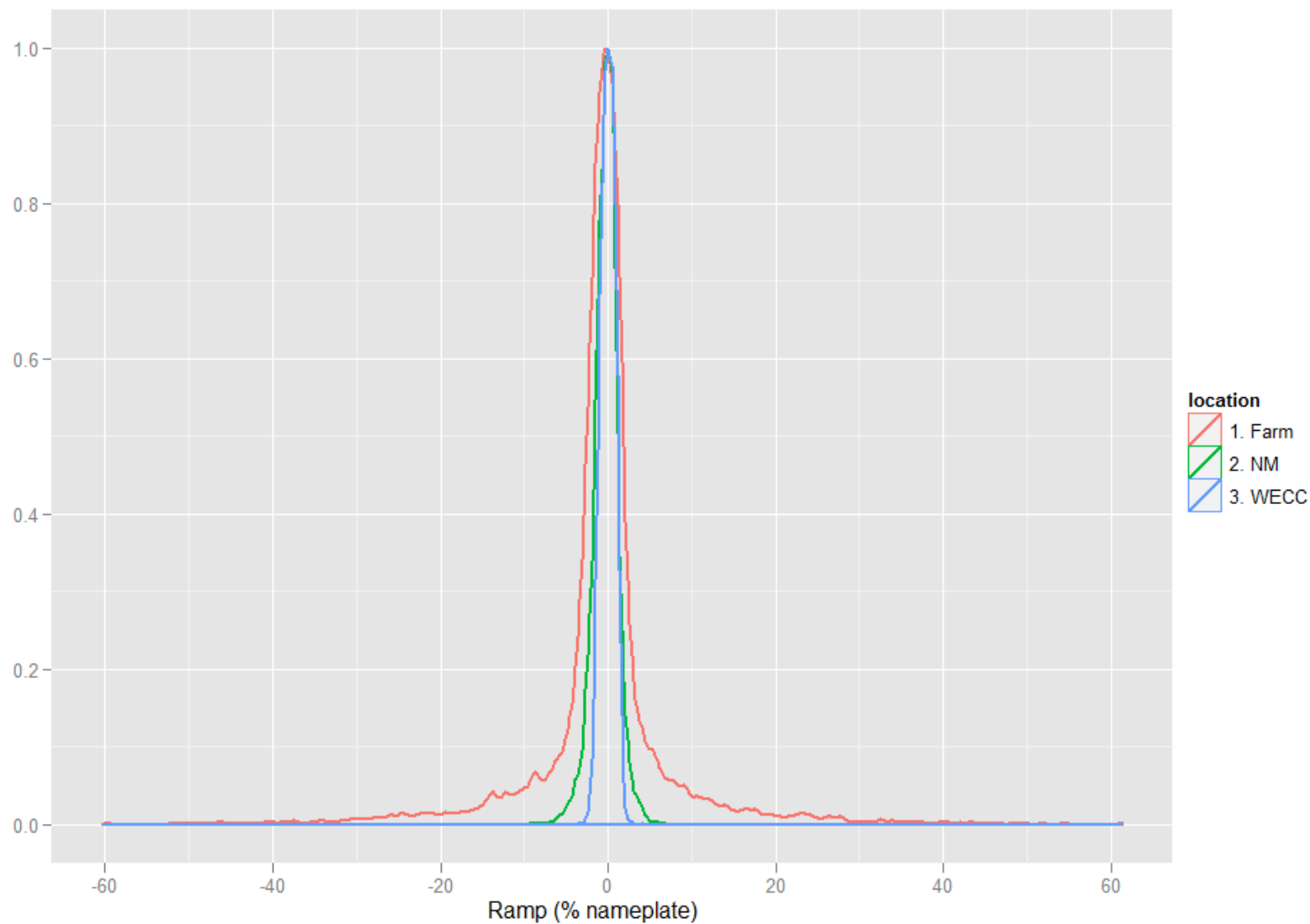
- Largest ramps are associated with sunrise and sunset.
- But the most meaningful happen midday
- 9-13 PST
- More info in write-up



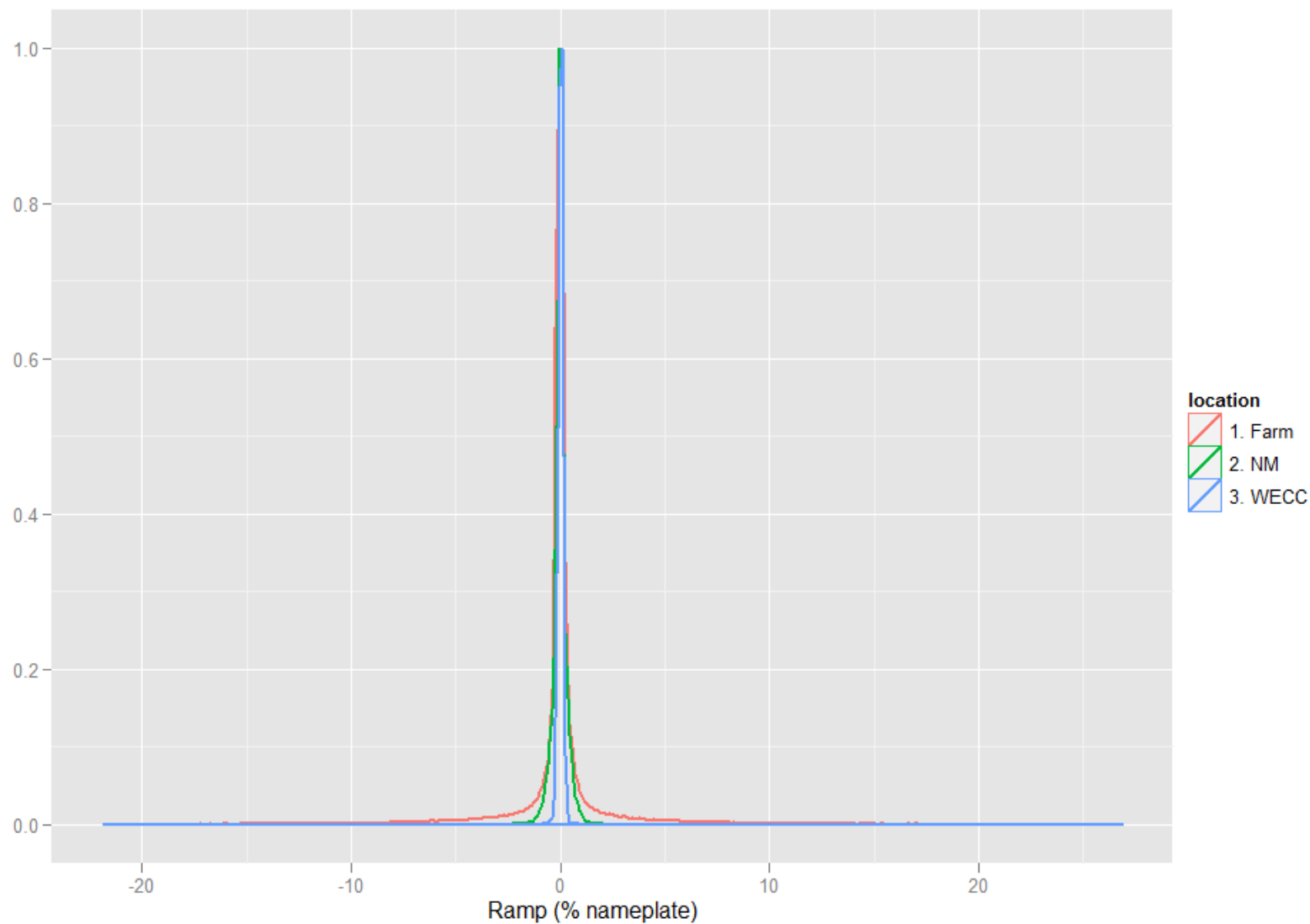
PV Midday smoothing effect (60-min)



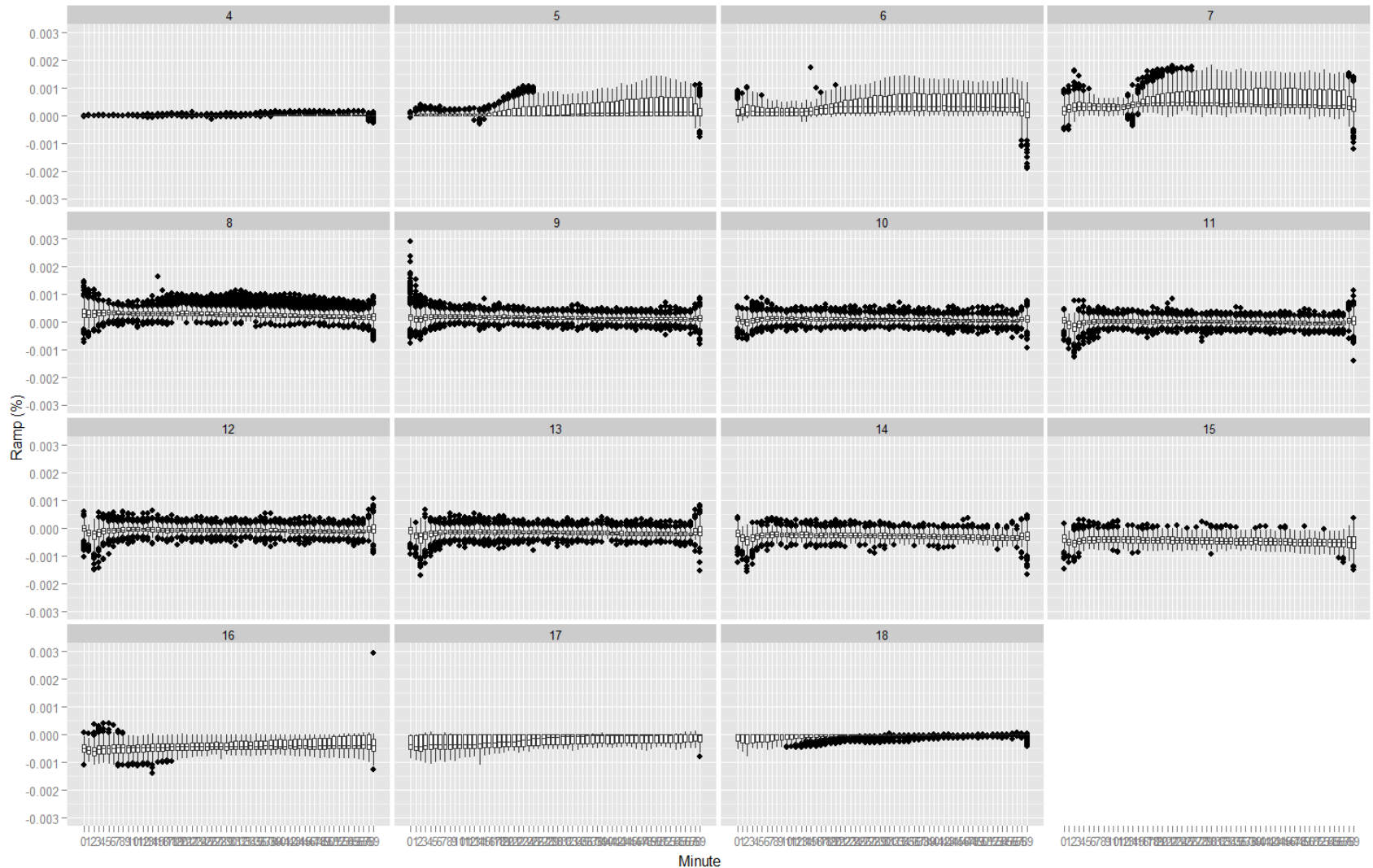
PV Midday smoothing effect (10-min)



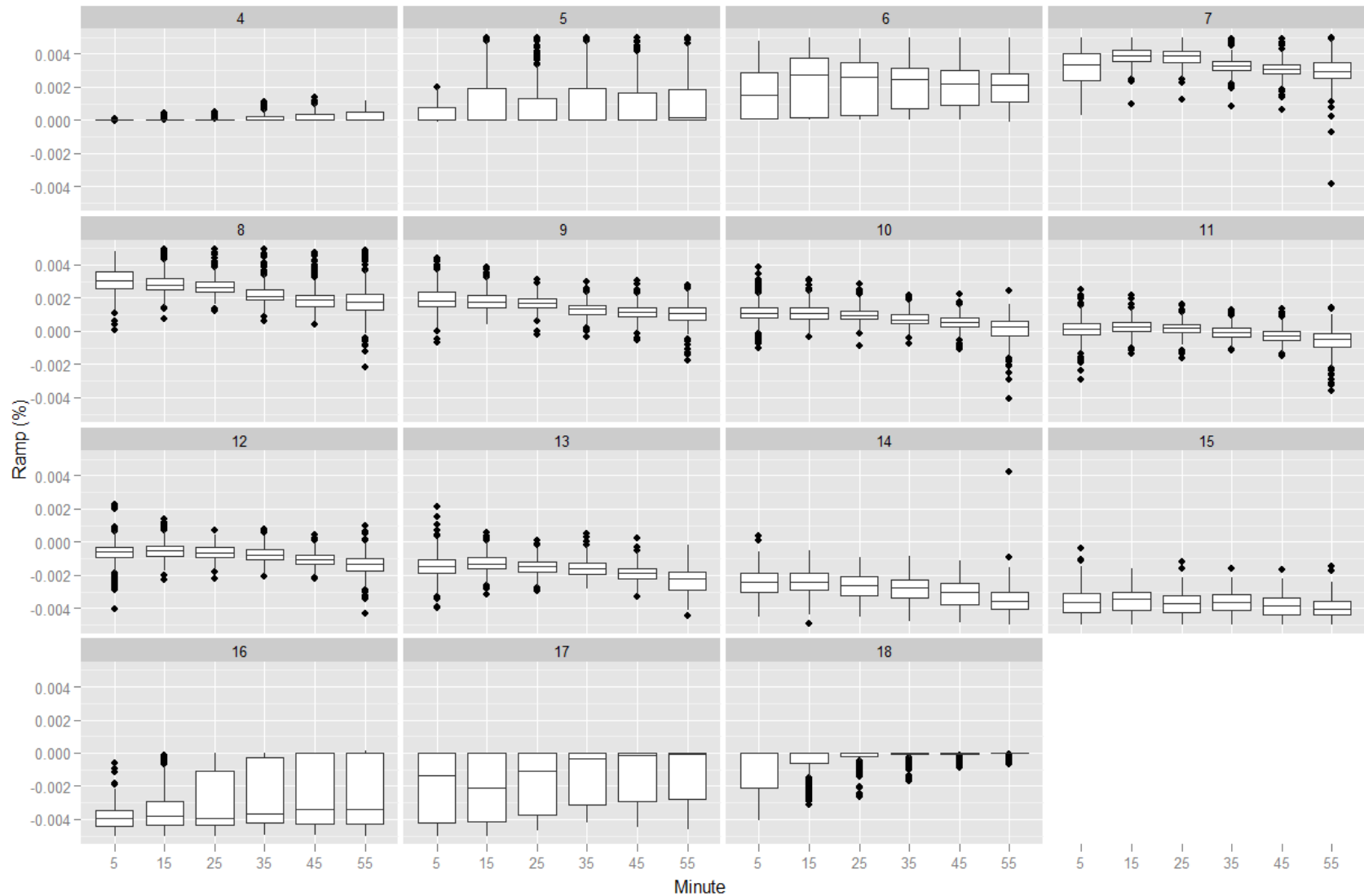
PV Midday smoothing effect (1-min)



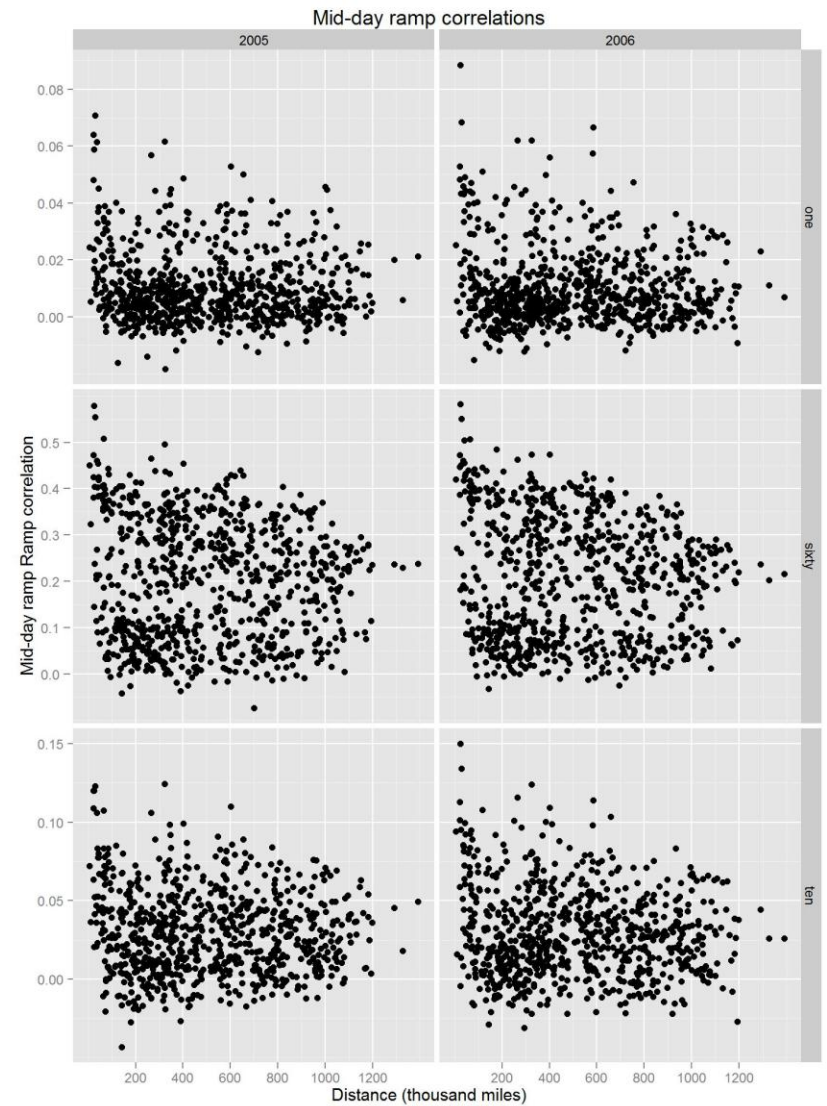
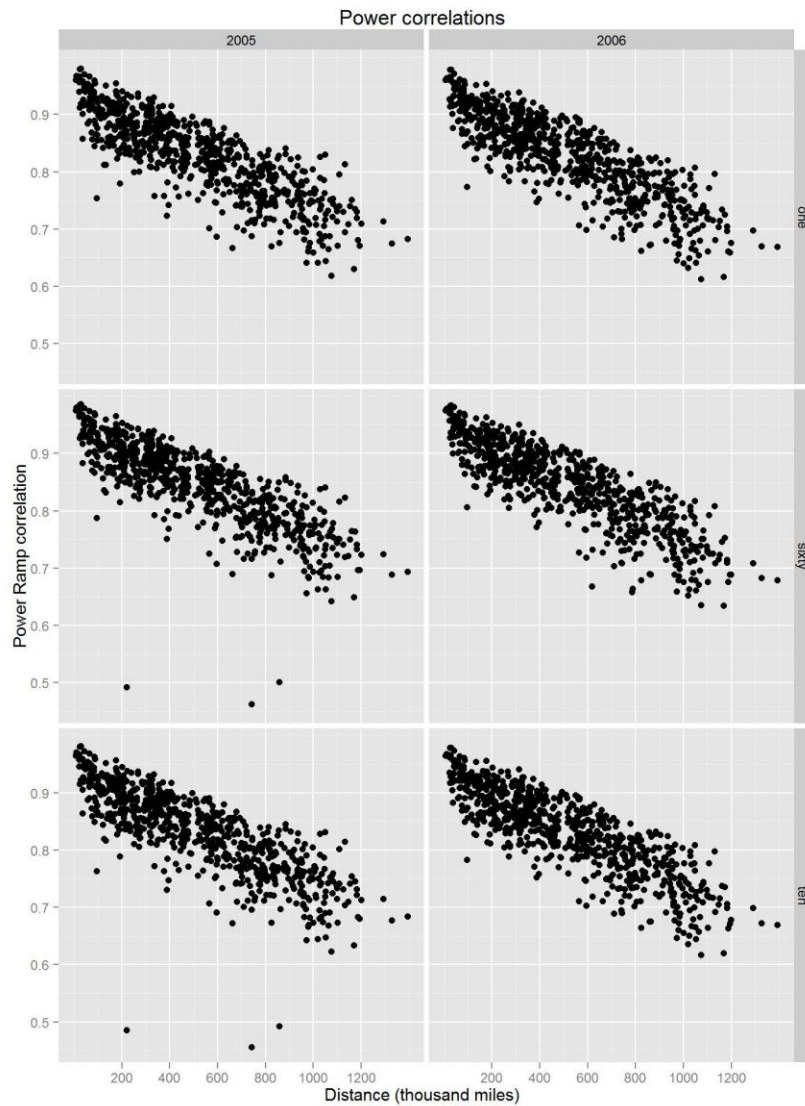
PV ramp blips (1-min)



PV ramp blips (10-min)



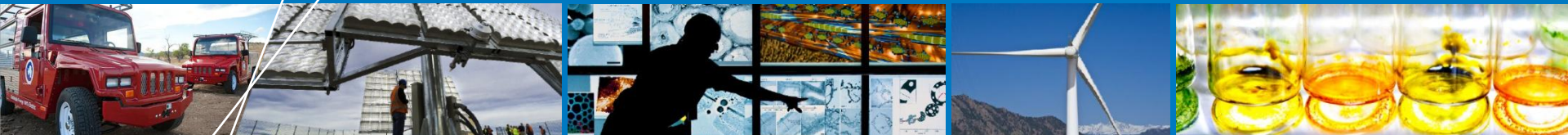
Power and Ramp Correlations



1

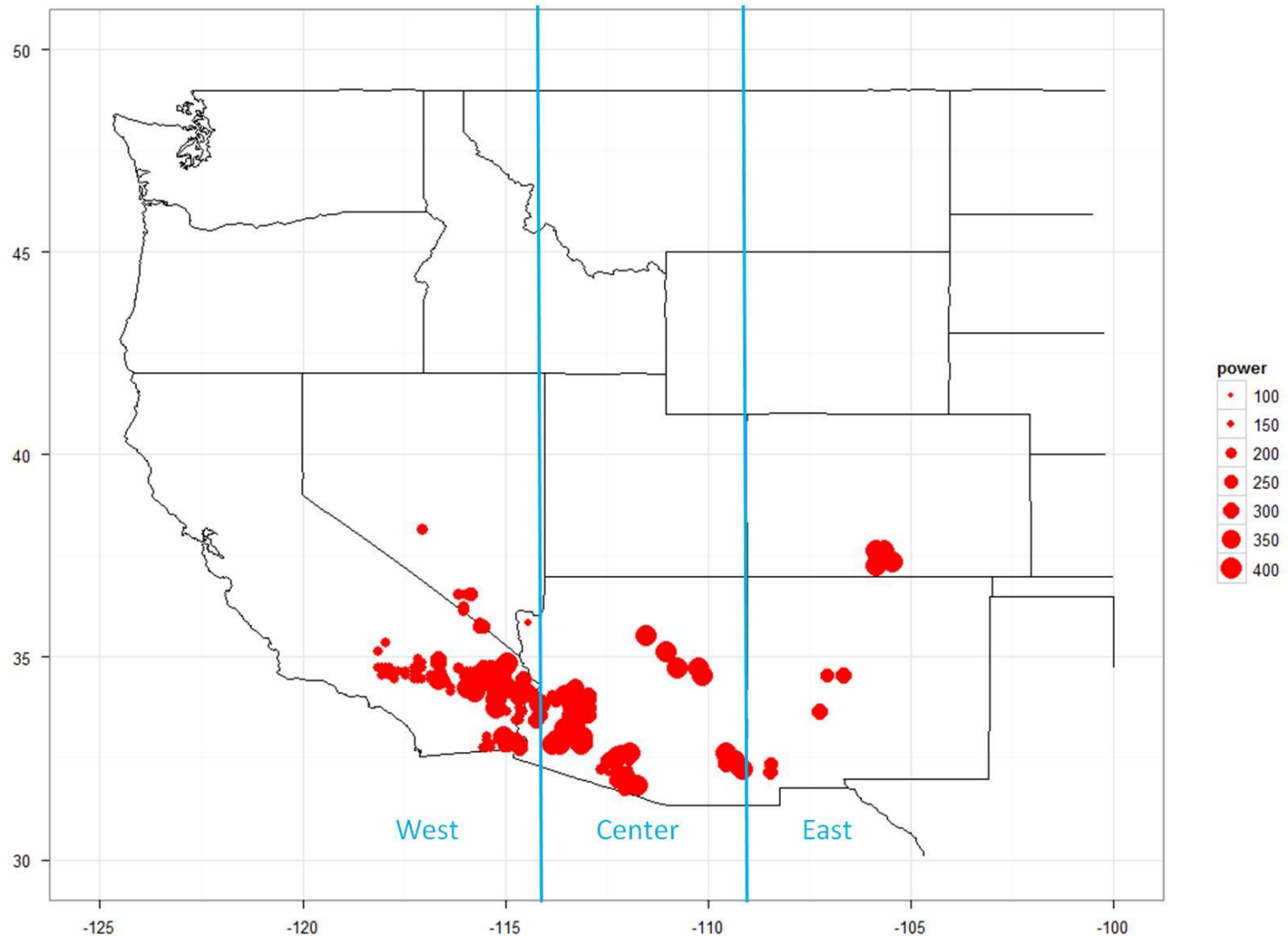
60

10

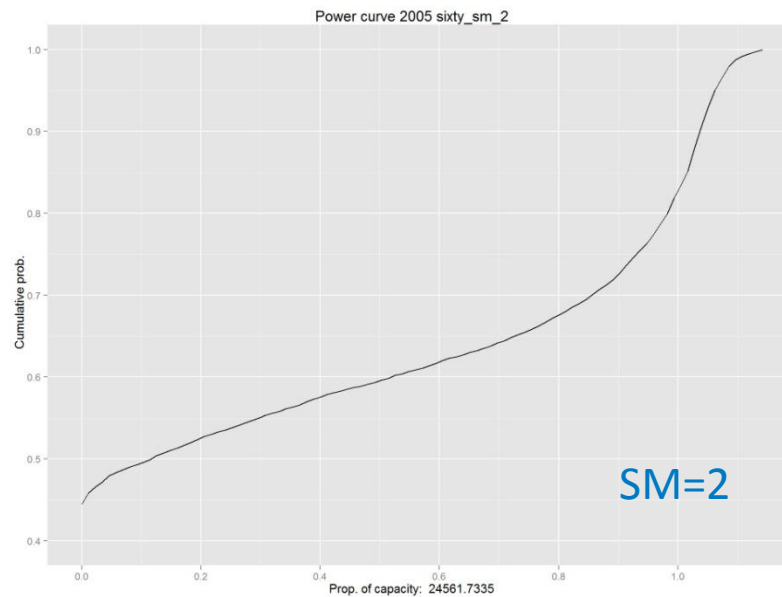
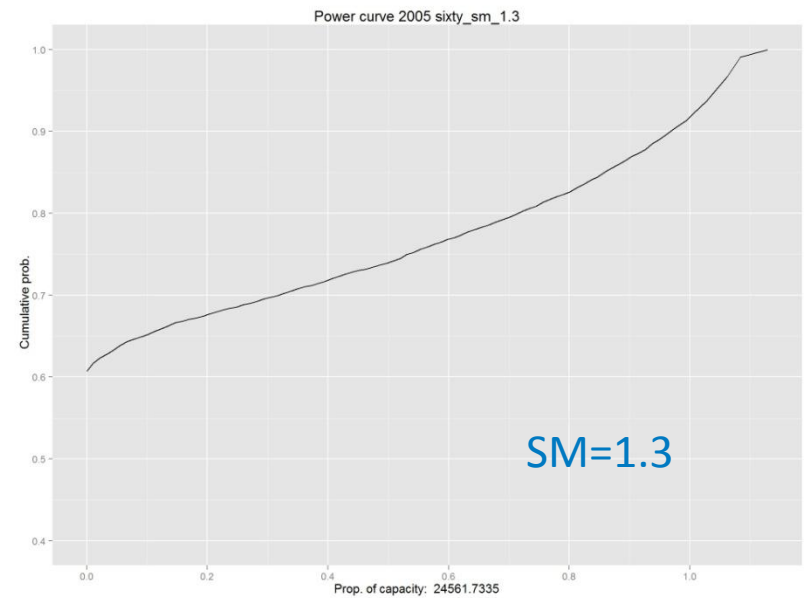
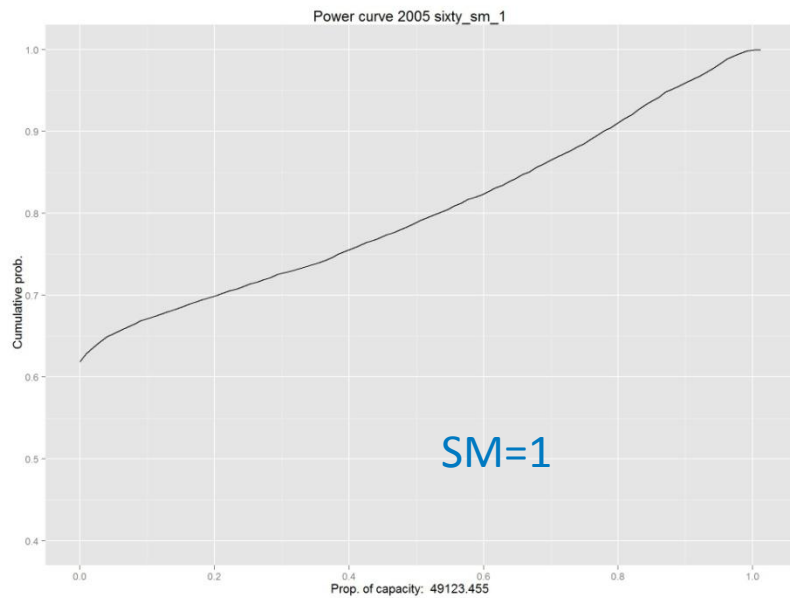


CSP Data

CSP Regions

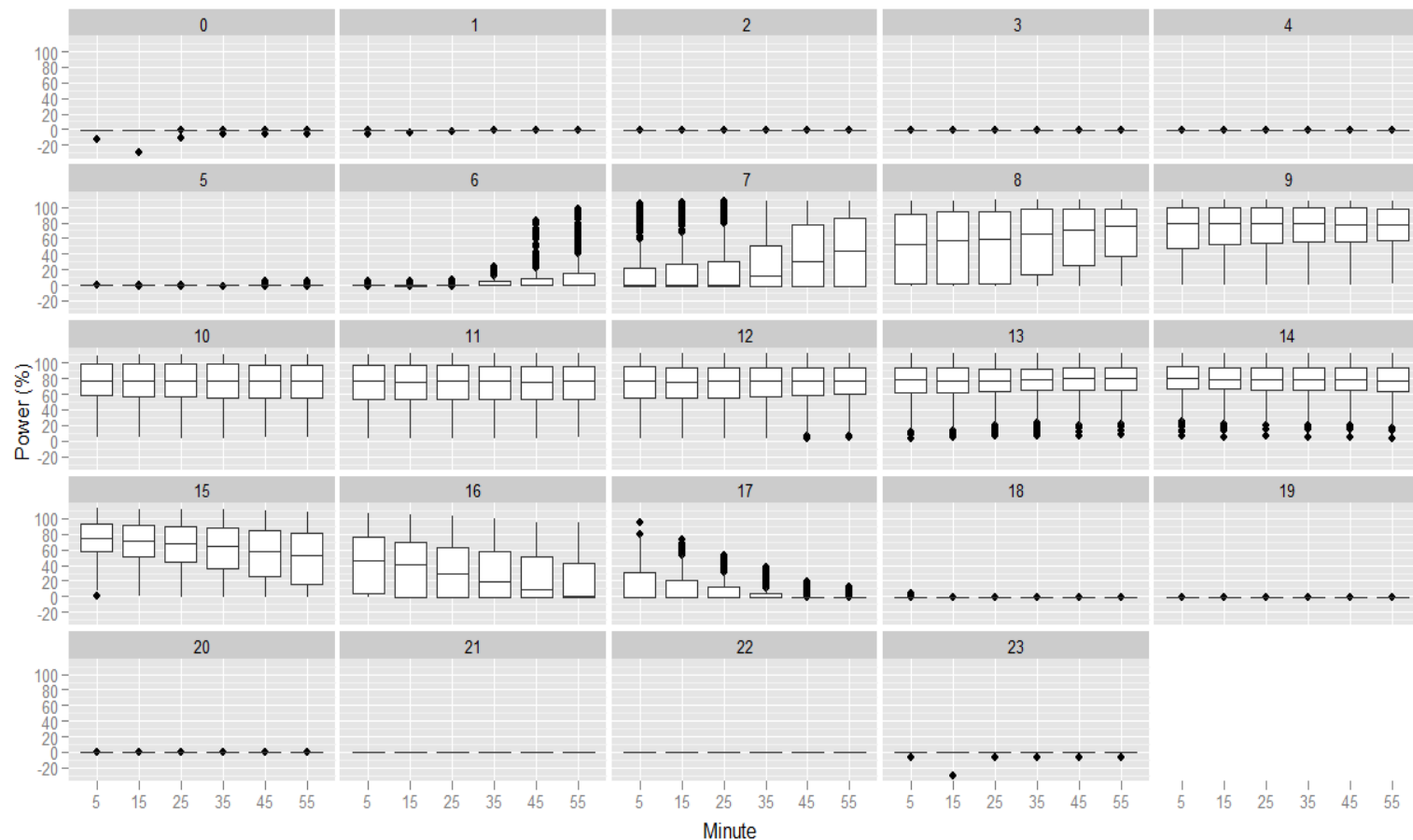


CSP power curves

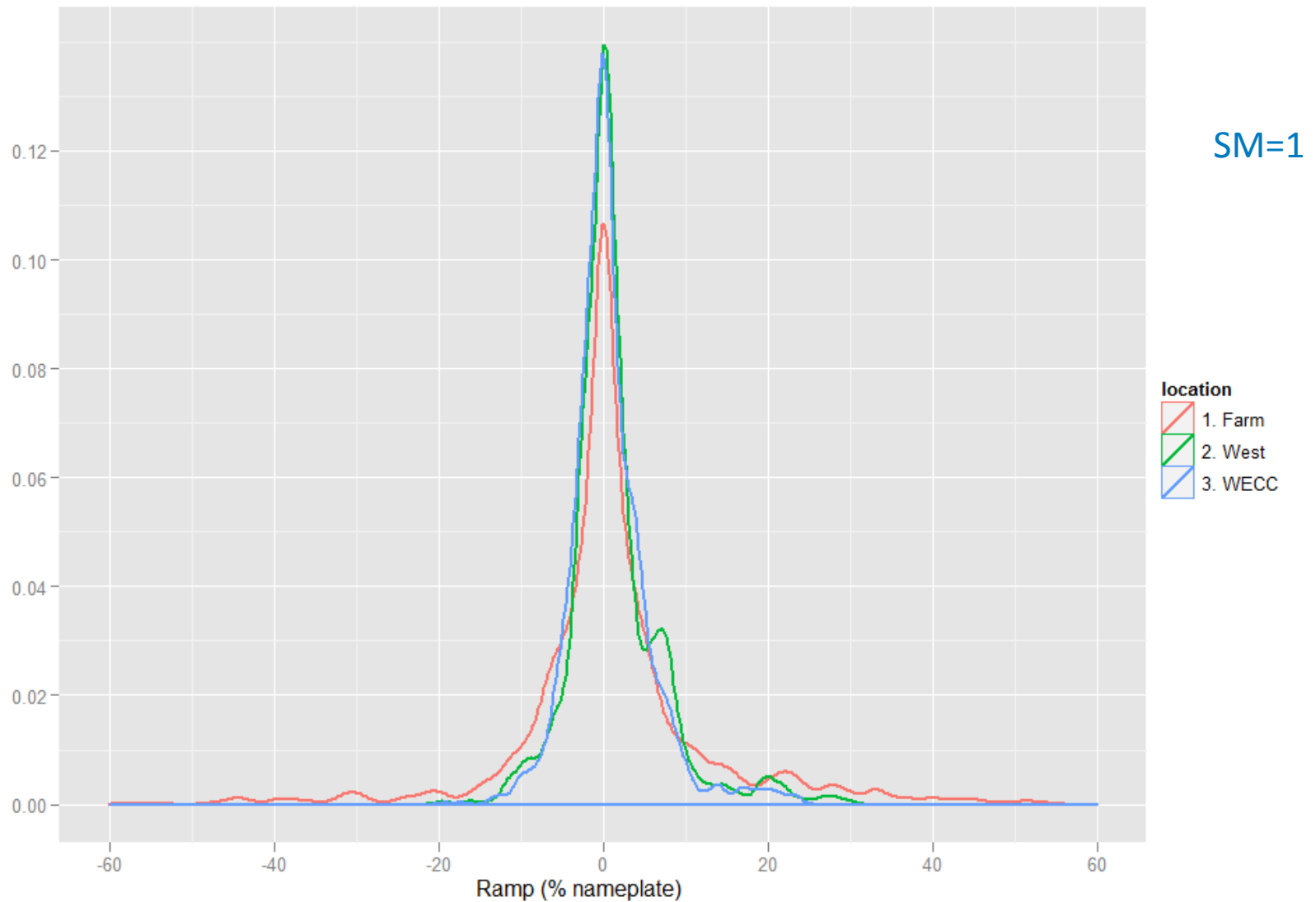


CSP ramps (SM=1.3)

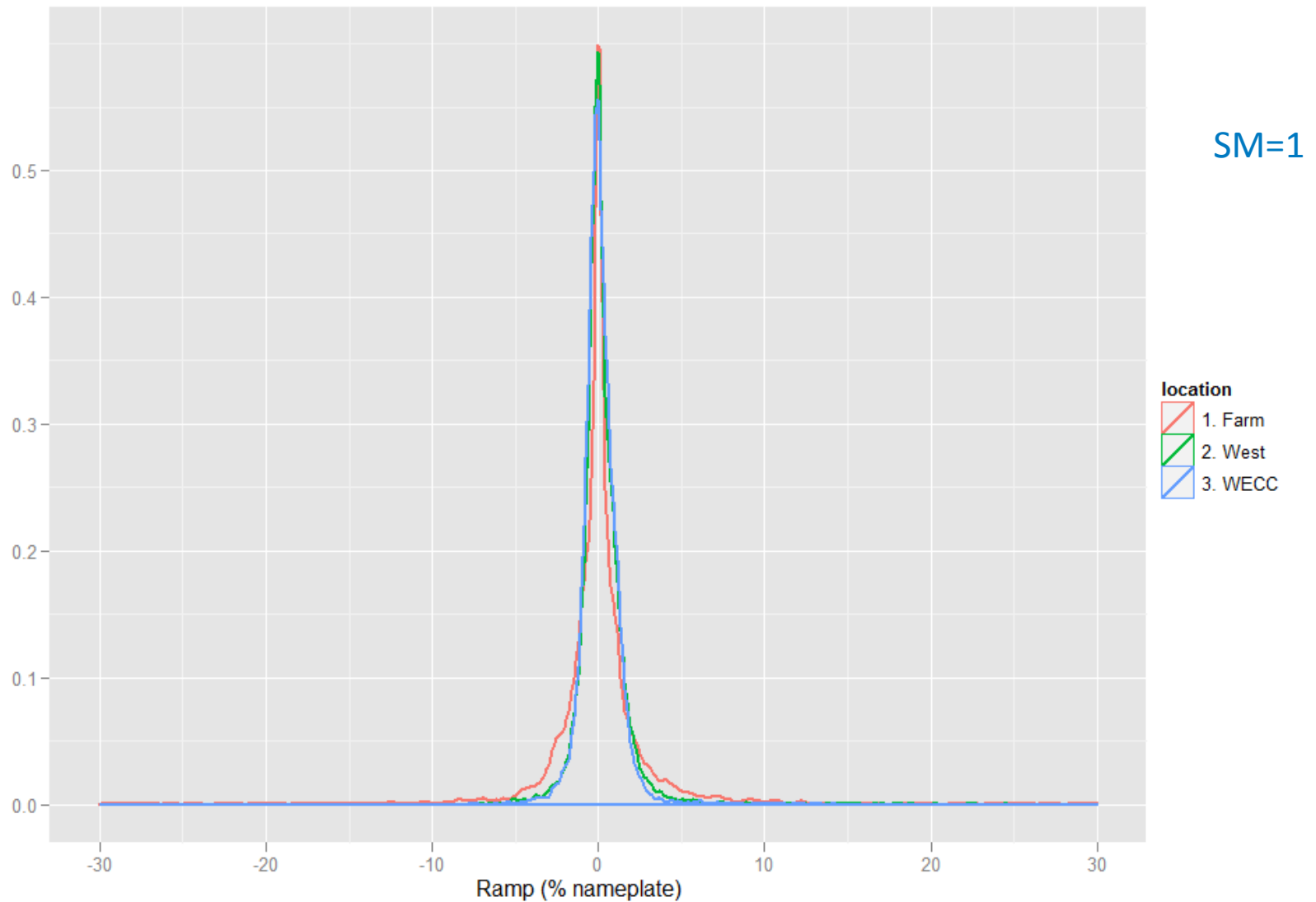
- Same midday definition (9-13 PST)
- More large ramps trickle in winter



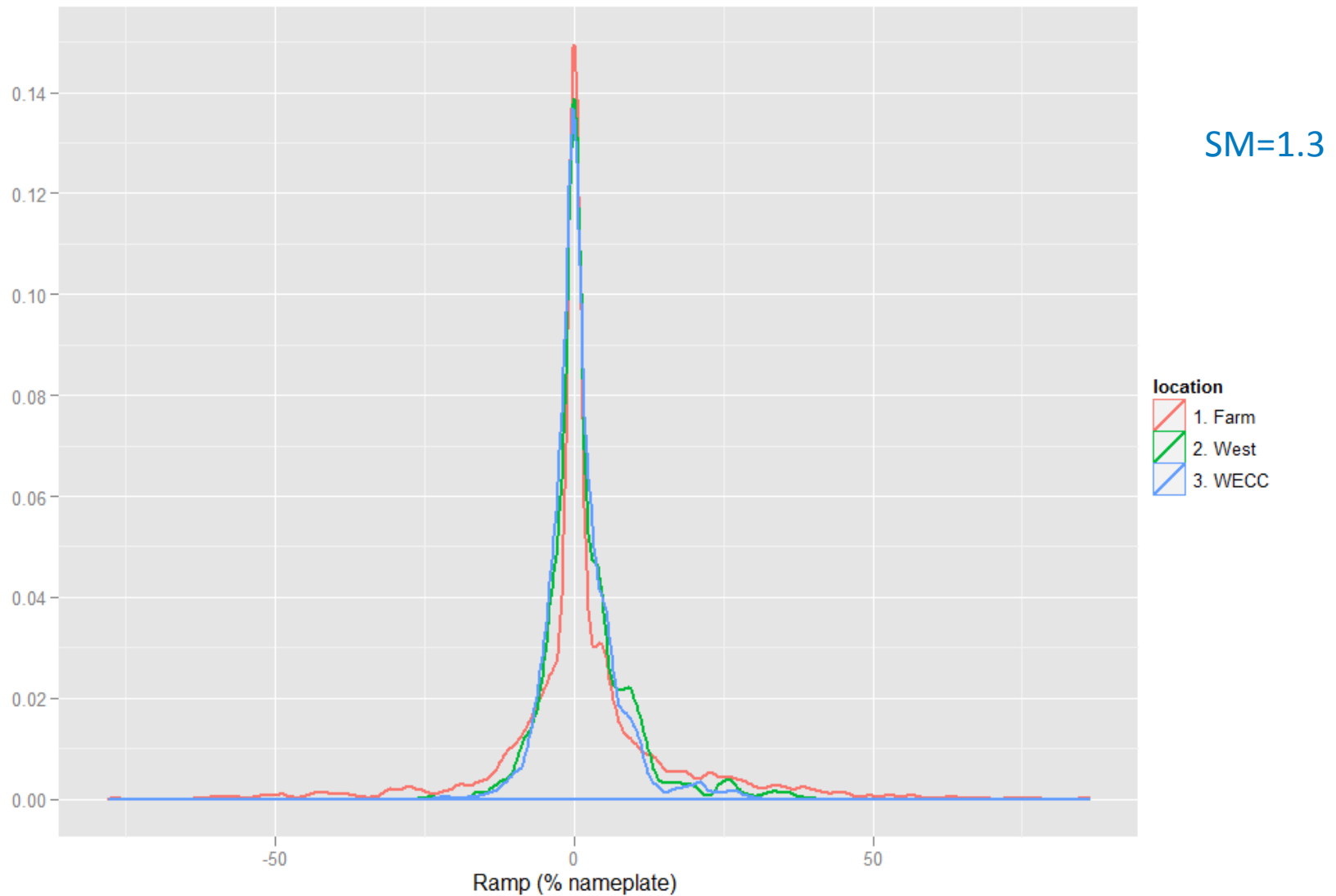
CSP Midday smoothing effect (60-min)



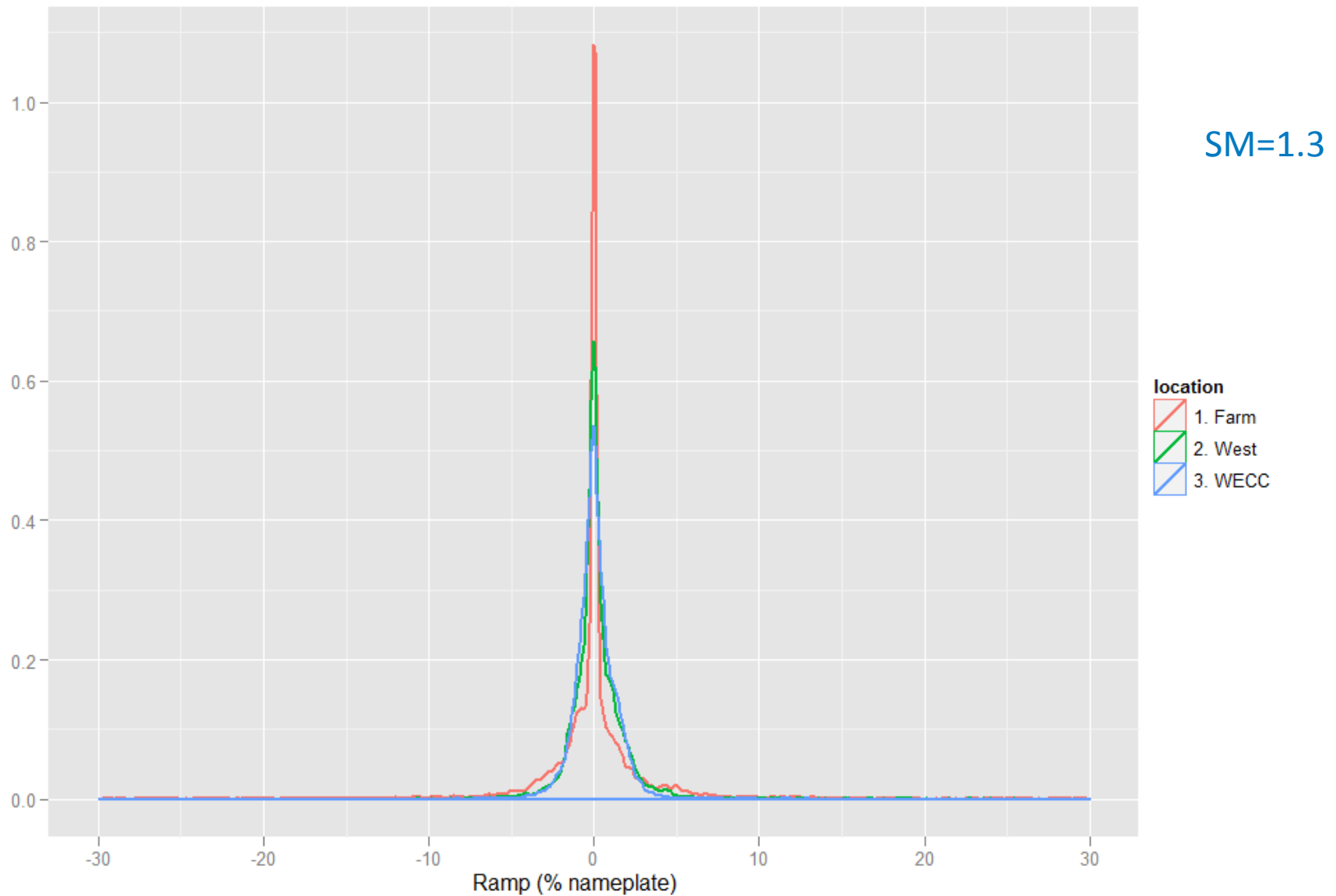
CSP Midday smoothing effect (10-min)



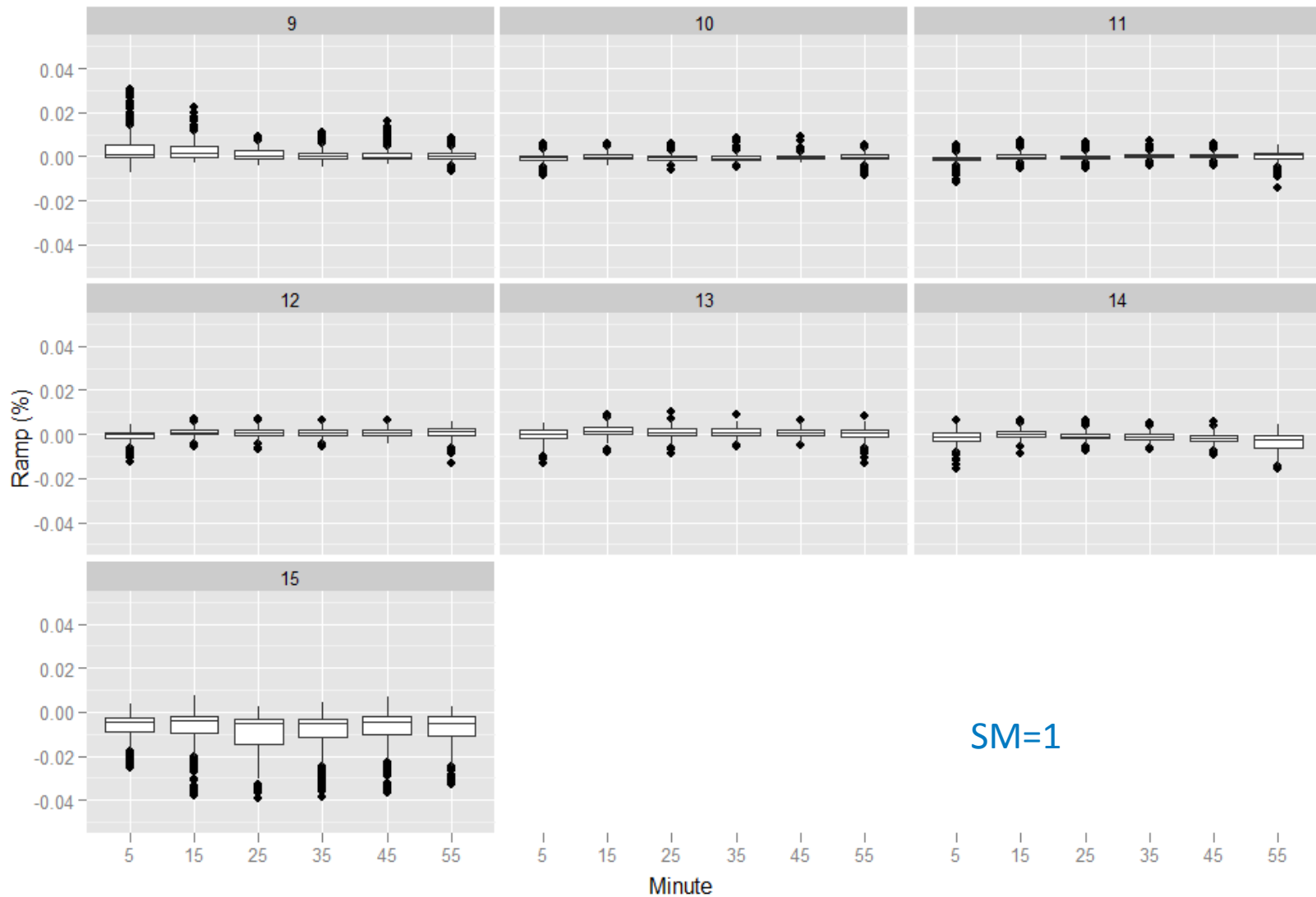
CSP Midday smoothing effect (60-min)



CSP Midday smoothing effect (10-min)

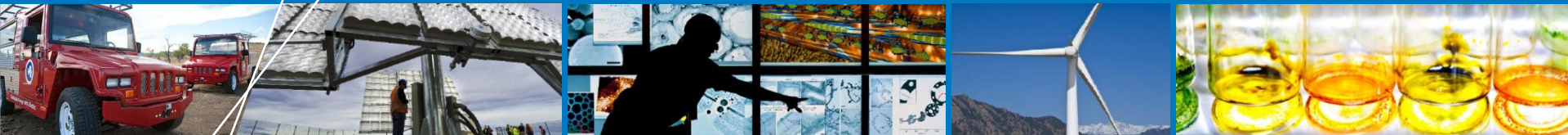


CSP ramp blips (10-min)



Summary

- **Power curves are smooth at all levels**
- **Geographic aggregation:**
 - Smoothing is significant for PV
 - CSP OK for $SM=1$, then distorted
- **Hourly ramp blips:**
 - Very noticeable at 1-min scale
 - Less concerning at 10-min scale
- **Good geographic correlations**



Questions?

Suggestions:

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